## REMARKS

The Examiner's attention is directed to recall the telephone interview conducted April 27, 2005. Specifically discussed during the interview were claims 9, 10, 13, and 14 and the applicability of the Andonian reference. In particular, the distinctions regarding the helm control system and direction control system being claimed as closed loop systems and the distinctions about the bandwidth of the helm control system (and direction control system) relative to the control processes in the master control unit. No agreement was reached during the discussion. Applicants have provided further detail with regard to these arguments herein.

### *Allowable Subject Matter*

Claims 3-8, 11, 12, 15-19, 22-27, 29, 30, 32-37, 42, 45-51, 55, 56, 59-66, 69, 72-76, 79, 80, and 82-90 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants appreciate the Examiner's noting the allowable subject matter.

### *Claim Disposition*

Claims 1 – 92 are pending in the application. Claims 1, 2, 9, 10, 13, 14, 20, 21, 28, 31, 38 – 44, 52-54, 57, 58, 67, 68, 70, 71, 77, 78, 81, 91 and 92 have been rejected. Claims 3 – 8, 11, 12, 15 – 19, 22-27, 29, 30, 32-37, 45 – 51, 55, 56, 59-66, 69, 72-76, 79, 80, and 82-90 have been objected to.

### *Claim Objections*

With respect to Detailed Action Items 4 - 6:

Claims 2 and 23, 26, 32, 34, 39, 40, 43, 44, and 68-92 stand objected to because of informalities. The Examiner states:

> "In claim 2, lines 2 and 3, "said rudder control system" has no clear antecedent."
>
> "In claim 23, line 2 "said damping torque command signal" has no clear antecedent."

"In claim 26, last line "said variable steering ratio signal" has no clear antecedent."

"In claim 32 "said position command signal" of the next to the last line has no clear antecedent."

"In claim 34, lines 2 and 3, "said rudder control unit" and "said position command signal" have no clear antecedents."

"In claim 38, line 1 "The storage medium" has no clear antecedent. - A storage medium-is suggested."

"In claim 39, line 1 "The computer data signal" has no clear antecedent. - A computer data signal- is suggested."

"In claim 40, line 9 a comma should be inserted after "signal".

"In claim 43, lines 2 and 3 "said rudder control system" has no clear antecedent."

"In claim 44, line 2 a comma should be inserted after "signal".

"In claims 68-90, all of which now depend from claim 67 directly or indirectly, "The method for steering a watercraft" of line 1 should be changed to —The method for directing a watercraft" as is claimed in line 1 of claim 67."

"In claim 91, line 1 "The storage medium" should be changed to —A storage medium-."

"In claim 92, line 1 "The computer data signal" should be changed to —A computer data signal-."

Applicants appreciate the Examiner's observations and have amended Claims 2 and 23, 26, 32, 34, 38, 39, 40, 43, 44, and 67, 91 and 92, accordingly to address the Examiner's concerns. Claims 23, 26, 32, and 34 have been amended to correct their dependency.

***Claim Rejections 35 U.S.C. §102***

Claims 1, 2, 9,10,13,14, 20, 21, 28, 31, 38-41, 43, 44, 52-54, 57, 58, 67, 68, 70, 71, 77, 78, 81, 91 and 92 stand rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Andonian et al., U.S. Patent No, 2002/0079155A1 hereinafter referred to as Andonian. Applicants respectfully traverse. The Examiner states that:

"Andonian et al. discloses a steer-by-wire system which can be used on a boat-

see column 2, line 11. The directional control system is 14. The rudder position sensor of the directional control system is 30. The helm control system is 12. The helm command signal comes from steering device 32. The operator is 34. The tactile feedback to the operator is provided by 22. Steering sensor 18 includes the helm position sensor and a torque sensor to produce and transmit a helm position signal and a helm torque signal. (see column 2, lines 15-20). The watercraft speed sensor would be part of vehicle sensor 40-see column 3, line 44. The master control unit in operable communication with the speed sensor, the helm control system 12 and the direction control system 14 is controller subsystem 16. The master control unit inherently includes a torque control process for generating a helm command signal 36 based on the helm torque signal, the helm position signal and the watercraft speed signal. See column 3, last 5 lines and column 4, lines 1-14."

"With regard to claim 2, the rudder force sensor is part of turning sensor 30. The rudder force sensor would inherently produce and transmit a rudder force signal to which the rudder control system 24 would be responsive through its feed back to the master control unit 16."

"The closed loop system of claim 9 includes 32, 18, 20 and 35 of figure 2."

"With regard to claim 10, it is inherent that the helm control system 12 is configured to exhibit a bandwidth sufficient to facilitate the torque control process maintaining stability of the watercraft steer-by-wire system; otherwise, the watercraft would not be able to be steered in a safe manner."

"With regard to claim 13, it is also inherent that the direction control system 14 is configured to exhibit a bandwidth sufficient to facilitate the position control process to maintain stability of the watercraft steer-by-wire system. Absent this the watercraft would not be able to be safely controlled leading to possible injury and property damage."

"The closed loop control system of claim 14 includes 16, 36, 24, 30 and the feedback from turning sensor 30 to controller subsystem 16."

"With regard to claim 20, in Andonian et al, the watercraft speed signal is received from 40, the helm position signal is received from 18, the helm torque sensor signal is received from 18, the rudder position signal is received from 30, the generated helm command signal to a helm control system based on the helm torque signal, the helm position signal and the watercraft speed signal is that shown by the line connecting controller 16 to steering actuator 20, the tactile feedback to an operator is 22 and the generated directional command signal to a direction control system 14 based on the watercraft speed signal, the rudder position signal and the helm position signal is 36."

"With regard to claim 21, the rudder force signal is received from 30 and the helm command signal is based on this rudder force signal. Also, the generated direction control command signal 36 is based on the watercraft speed, the helm position signal and at least one of the rudder position signal and the rudder force signal. This is show by the direction of the lines connecting sensor 40, controller 16, turning actuator 24 and turning sensor 30 which senses both rudder angle and torque.

Again, it would be inherent that the generated torque command signal in the helm control system 12 would exhibit a bandwidth sufficient to facilitate a torque control process generating the helm command signal to facilitate maintaining stability of the steering. Absent this, the watercraft would not be able to be controlled leading to both injury and property damage. Again, it would be inherent that the generated position command signal of the direction control system 14 would exhibit a bandwidth sufficient to facilitate a position control process generating the rudder command signal to facilitate maintaining stability of the steering. Absent this the watercraft would not be able to be controlled leading to both injury and property damage."

"With regard to claim 38, it is inherent that the storage medium 16 of Andonian et al is encoded with a machine-readable computer program code for steering a watercraft, the storage medium including instructions for causing a computer to implement a method comprising receiving a watercraft speed signal from 40, receiving a helm position signal from 18, receiving a helm torque signal from 18, receiving a rudder position signal from 30, generating a helm command signal to a helm control system 12 based on the helm torque signal, the helm position signal and the watercraft speed signal to provide tactile feedback 22 to an operator and generating a direction control command signal 36 to a direction control system 14 based on the watercraft speed signal from 40, the rudder position signal from 30, and the helm position signal from 18 to control direction of the watercraft."

"With regard to claim 39, the computer data signal for steering a watercraft comes from controller subsystem 16 which computer data signal includes instructions for causing a computer within subsystem 16 to implement a method comprising receiving a watercraft speed signal from 40; receiving a helm position signal from 18; receiving a helm torque sensor signal from 18; receiving a rudder position signal from 30; generating a helm command signal to a helm control system 12 based on said helm torque signal , said helm position signal and said watercraft speed signal to provide tactile feedback 22 to an operator; and generating a directional command position signal, and said helm position signal to control direction of said watercraft."

"With regard to claim 40, Andonian et al discloses a watercraft steer-by-wire control system (see column 2, lines 10-15) comprising a direction control system 14 responsive to a directional command signal 36 for steering a watercraft, said direction control system 14 including a rudder position sensor 30 to measure and transmit a rudder position signal, a helm control system 12 responsive to a helm command signal for receiving a directional input to a helm from an operator 34 and providing tactile feedback 22 to an operator, said helm control system including a helm position sensor 18 to produce and transmit a helm position signal, a master control unit 16 in operable communication with said helm control system, and said direction control system; said master control unit 16 inherently includes a position control process for generating said directional command signal 36 in response to said helm position signal. Andonian et al also discloses that the watercraft steer-by-wire control system includes a watercraft speed sensor 40 for producing a watercraft speed signal and wherein said position control process is responsive to said watercraft speed signal. With regard to claim 43, the rudder force sensor is 30."

"With regard to claim 44, the helm torque sensor is part of 18. The master control unit would inherently include a torque control process for generating the helm

command signal based on the helm torque signal and the helm position signal received from 18 and the watercraft speed signal received from 40."

" With regard to claim 52, that the tactile feedback 22 includes a resistive force is discussed in column 3, lines 42 and 43. The closed loop system of claim 53 includes 32,18,16 and 20. It is inherent that the bandwidth defined in claims 54 and 57 is exhibited such that the watercraft is controlled and injury loss and personal property loss are not experienced. This is a given. It has to be done in order to control the watercraft. The closed loop system of claim 58 includes 16, 36, 24, 30 and 16."

"With regard to claims 67 and 68, Andonian et al discloses a method for directing a watercraft with a watercraft steer-by-wire system comprising receiving a helm position signal from 18; receiving a rudder position signal from 30 generating a helm command signal to a helm control system based on said helm position signal to provide tactile feedback 22 to an operator; generating a directional command signal 36 to a direction control system 14 based on said rudder position signal, and said helm position signal to control direction of said watercraft receiving a watercraft speed signal from 40 wherein at least one of said generating a helm command is further based on said watercraft speed signal and said generating a directional command signal is further based on said watercraft speed signal."

"Andonian et al also discloses for claims 70 and 71 the method for steering a watercraft of further comprising receiving a rudder force signal from 30, and wherein said a helm command signal is also based on said rudder force signal; generating a directional command signal 36 to a direction control system 14 based on said watercraft speed signal from 40, said helm position signal from 18, and at least one of said rudder position signal and said rudder force signal from 30 and receiving a helm torque signal from 18 and wherein said generating a helm command is further based on said helm torque signal."

"The resistive force of claim 77 is discussed in column 2, lines 40-45 of Andonian et al."

"With regard to claims 78 and 81, it is inherent that the bandwidth defined in theses claims is exhibited such that the watercraft is controlled and injury loss and personal property loss are not experienced."

"With regard to claim 91, Andonian et al. inherently discloses a storage medium in controller subsystem 16 that is encoded with a machine-readable computer program code for steering a watercraft, said storage medium including instructions for causing a computer to implement a method comprising receiving a helm position signal from 18; receiving a rudder position signal from 30; generating a helm command signal to a helm control system based on said helm position signal to provide tactile feedback 22 to an operator; and generating a directional command signal 36 to a direction control system 14 based on said rudder position signal from 30, and said helm position signal from 18 to control direction of said watercraft."

"Andonian et al for claim 92 also discloses a computer data signal from control subsystem 16 for steering a watercraft, said computer data signal including instructions for causing a computer within subsystem 16 to implement a method

comprising receiving a helm position signal from 18; receiving a rudder position signal from 30; generating a helm command signal to a helm control system 12 based on said helm position signal to provide tactile feedback 22 to an operator, and generating a directional command signal 36 to a direction control system 14 based on said rudder position signal, and said helm position signal to control direction of said watercraft."

Applicants respectfully contend that the explanation in the Office Action mischaracterizes the teachings of Andonian as applied to the claimed invention. To anticipate a claim under 35 U.S.C. §102, a single source must contain all of the elements of the claim. *Lewmar Marine Inc. v. Barient, Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766, 1768 (Fed. Cir. 1987), cert. denied, 484 U.S. 1007 (1988). Moreover, the single source must disclose all of the claimed elements "**arranged as in the claim.**"(emphasis added) *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984). Moreover, **"[t]he identical invention** must be shown **in as complete detail as is contained in the ...claim.**"(emphasis added) *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

With regard to Claims 1, 2, 9, 10, 13, 14, 20, 21, 28, 31, 38-44, 57, 58, 67, 68, 70, 71, 78, 81, 91 and 92 and more specifically, claims 9, 10, 13, 14, 28, 31, 57, 58, 78, and 81 Applicants respectfully contend that Andonian does not teach or disclose each element of the invention "arranged as in the claim". Specifically, Andonian does not teach or disclose, "said helm control system comprises a closed loop control system responsive to said helm command signal and said helm torque signal." In particular, the disclosure of Andonian does not specifically state that the steering subsystem 12 is a closed loop control system. The Examiner' suggestion is based on the inference with reference to the figures. However the Examiner appears to be mischaracterizing the closed loop control system being claimed. In particular in this instance that system is the helm control system 12, which is also depicted in Figure 2 as including the helm control unit 40 and helm dynamics unit 42. The closed loop system claimed is based on these two elements and helm torque feedback, and may be independent of any additional closed loop system that also includes the master control unit 16. In fact, in an exemplary embodiment there is another closed loop system including the

torque control process 70 based from the master control unit that provides an "outer loop" torque command (signal 36) to the helm control system 12.

Furthermore, it should be noted that the specification of Andonian is inconsistent in with regard to the system structure. The specification in reference to Figure 2 identifies signal 35 as the steering feedback signal. Yet the specification also teaches that the steering actuator 20 is preferably adapted to receive the steering feedback signal 35 from the control subsystem 16. See Col. 2, lines 44 – 46 and Col. 3, lines 18 – 21. However, line 35 is depicted as including no connection to the controller subsystem 16. This clearly indicates that there is an error either in the specification or the figure. Applicants suggest that to clarify the figure the arrow depicted from the controller subsystem 16 to the steering actuator 20 should have been labeled as 35 and that the line indicated as 35 merely depicts the mechanical connection between the steering actuator 20 and the steering device 32.

Second, it is noteworthy to appreciate that the helm command signal 36 relied upon by the Examiner is generated in the "outer" control loop including the master control unit 16 and sent to the helm control system 12 the "inner" closed loop system. Thus, if it is taken that Andonian teaches one of the control systems it clearly cannot teach the other. Therefore, if it is taken as suggested by the Examiner in the Response to Arguments section that the command is not the arrow marked 35 in Figure 2 of Andonian but that the equivalent command is indicated by the arrow from controller subsystem 16 to the steering actuator 20, then the suggested teaching that the steering subsystem 12 is a closed loop system dissolves. Therefore, based on the Examiner's position, Andonian cannot teach that the helm control system is a closed loop system.

Furthermore, Andonian does not teach or disclose, "said helm control system configured to exhibit a bandwidth sufficient to facilitate said torque control process maintaining stability of said watercraft steer-by-wire system." The Examiner suggests that the claimed features are inherent and are needed in order for it to steered in a save manner. (see Office action Page 4). Applicants respectfully disagree.

"To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is **necessarily present** (emphasis added) in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain

thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F. 3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). In order to support an anticipation rejection based on inherency, an Examiner must provide factual and technical grounds establishing that **the inherent feature necessarily flows from the teachings of the prior art**.(Emphasis added) *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int. 1990); *In re Oelrich*, 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981) (holding that inherency must flow as a necessary conclusion from the prior art, not simply a possible one). The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed.Cir. 1993).

Applicants submit that the Examiner has not made a prima facie case of anticipation of the claims based on inherency. The Examiner has not shown that the claimed features are **necessarily present** in the teachings of Andonian. In fact, the claimed language is based on the fact that the control structure of Applicants invention and Andonian are different as identified above. Applicants recognized the benefits of employing a helm control system with a minimum threshold bandwidth would permit the torque control process maintaining stability of the outer loop of the control system. Use of a higher bandwidth system, while possible, would of course, require additional expense and complexity. Furthermore, there is a practical limit on the bandwidth of certain components based on their physical characteristics. Thus, it is **not necessarily present in the teachings** of Andonian that "said helm control system configured to exhibit a bandwidth sufficient to facilitate said torque control process maintaining stability of said watercraft steer-by-wire system" and therefore it cannot be inherent. Therefore, because the Examiner has not made a prima facie case of anticipation based on inherency and Andonian does not disclose or teach an element of the invention it cannot anticipate the Applicants' claims. Thus, Claims 9, 10, 13, 14, 28, 31, 57, 58, 78, and 81 are allowable, the rejections are improper, and they should be withdrawn.

The arguments and amendments presented herein are made for the purposes of better defining the invention, rather than to overcome the rejections for patentability. The claims have not been amended to overcome the prior art and therefore, no presumption should attach that either the claims have been narrowed over those earlier presented, or that subject matter or equivalents thereof to which the Applicants are entitled has been surrendered. Allowance of the claims is respectfully requested in view of the above remarks. Moreover, no amendments as presented broaden the scope of the claimed invention and therefore cannot

necessitate a new grounds rejection.

It is believed that the foregoing remarks are fully responsive to the Office Action and that the claims herein should be allowable to the Applicants. In the event the Examiner has any queries regarding the instantly submitted response, the undersigned respectfully requests the courtesy of a telephone conference to discuss any matters in need of attention.

If there are additional charges with respect to this matter or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully Submitted,

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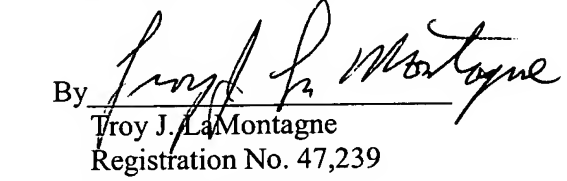
By 

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Date: May 02, 2005